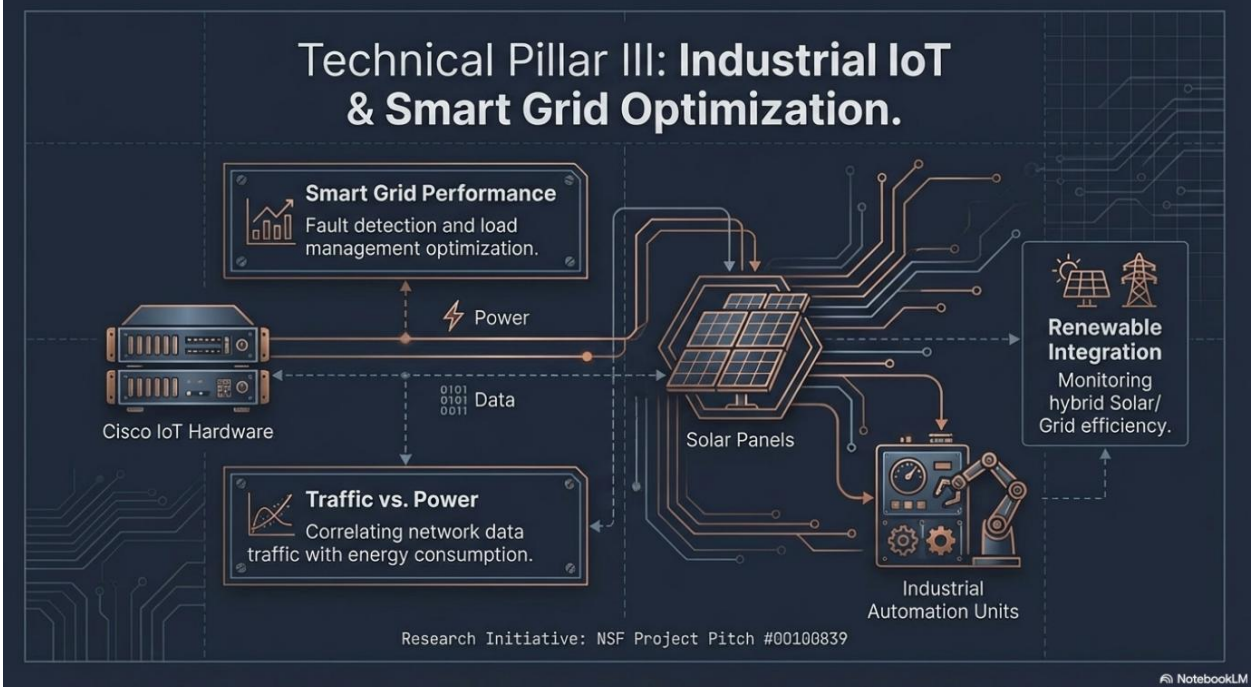
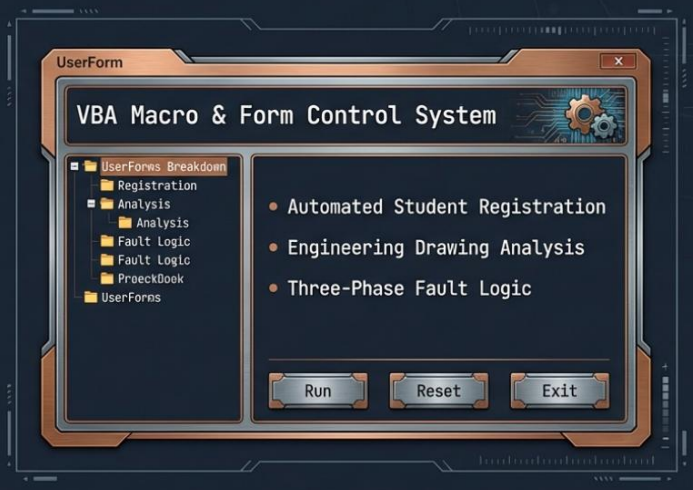
f

Technical Pillar II: Digital Transformation & Cloud Infrastructure.
JetBrains Mono
Data Warehousing & Querying
Microsoft Learn Plan
Invitation
Discover Data Concepts.
Institutional Use
Azure AI
Knowledge Mining & AI Agents
Microsoft Purview
Data Security
NotebookLM


Technical Pillar III: Industrial IoT & Smart Grid Optimization.
Smart Grid Performance
Fault detection and load management optimization.
Power
Data
Cisco IoT Hardware
Solar Panels
Renewable Integration
Monitoring hybrid Solar/ Grid efficiency.
Traffic vs. Power
Correlating network data traffic with energy consumption.
Industrial Automation Units
Research Initiative: NSF Project Pitch #00100839
NotebookLM

Proprietary Automation: The VBA Form Control System.

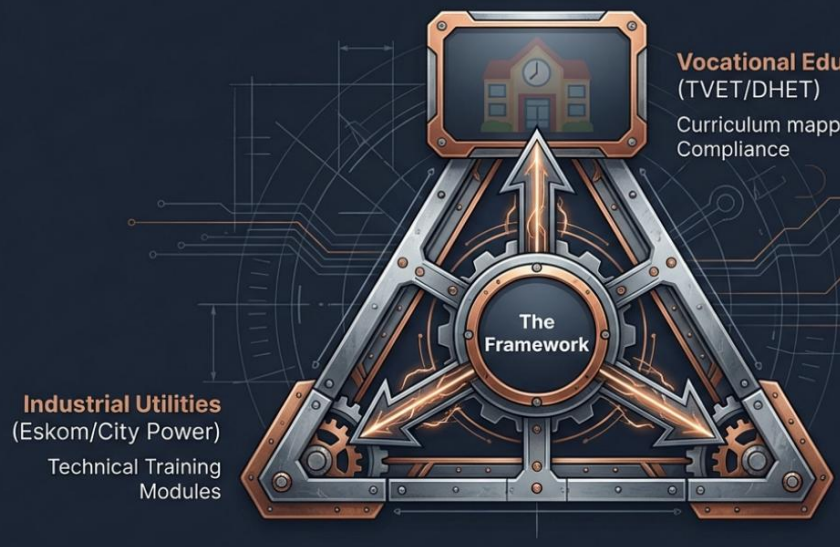


Research Initiative: AI-Driven Educational Analytics

> Pattern Recognition: Predicting success rates.
> Psychometrics: Identifying learning barriers.
> Neurodevelopmental Assessment: Accommodation planning.
> Outcome: Verifiable Digital Portfolios.

NotebookLM

Market Opportunity & Strategic Alignment



Vocational Education
(TVET/DHET)
Curriculum mapping & Compliance

Industrial Utilities
(Eskom/City Power)
Technical Training Modules

Certification Bodies
(QCTO/Umalusi)
Assessment Standardization

Academic Dissemination & Peer Review

International Journal of Engineering & Technical Research (IJETR)

4	3	1
Accepted Papers	Under Review	Pending

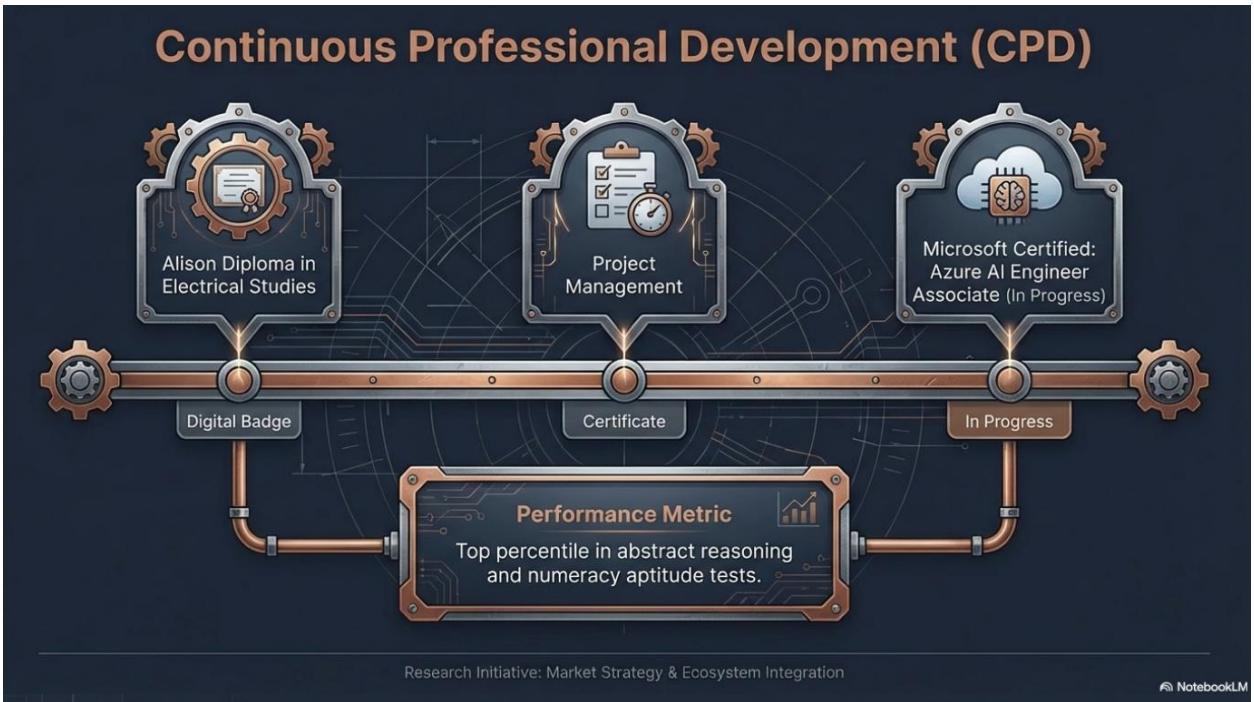
Project career master job engineering thesis

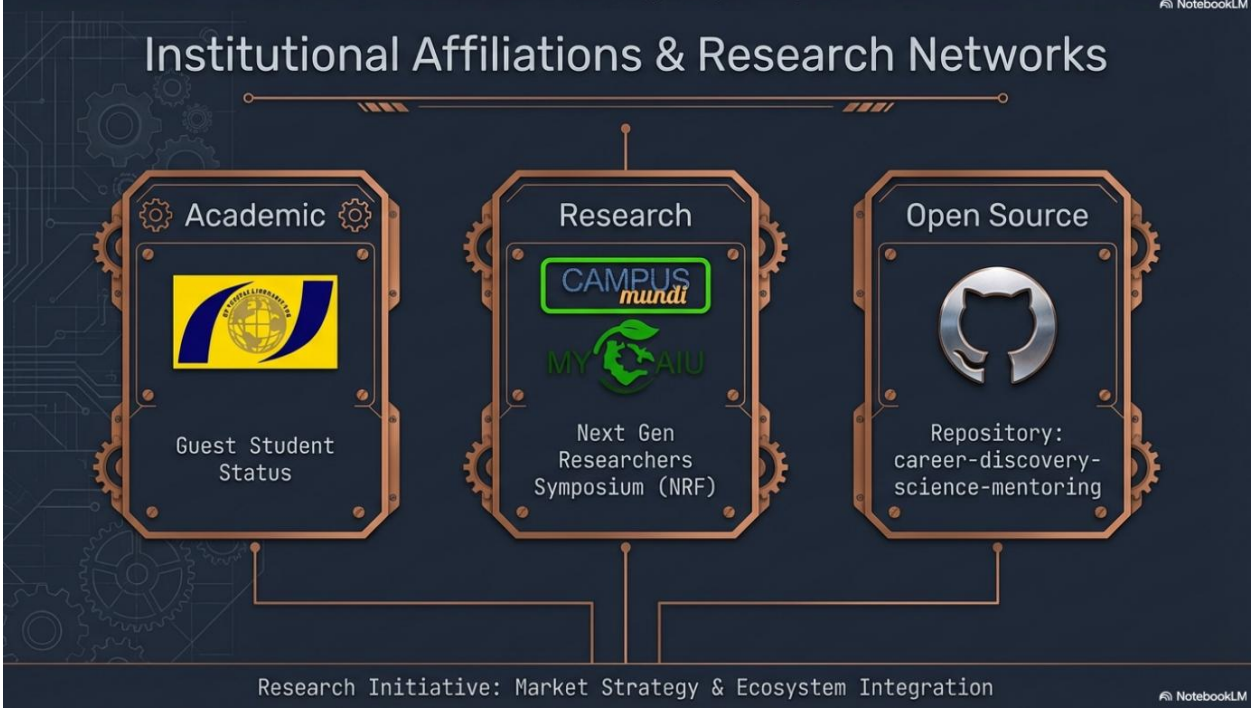
Thesis: Degree honour, council quality rules

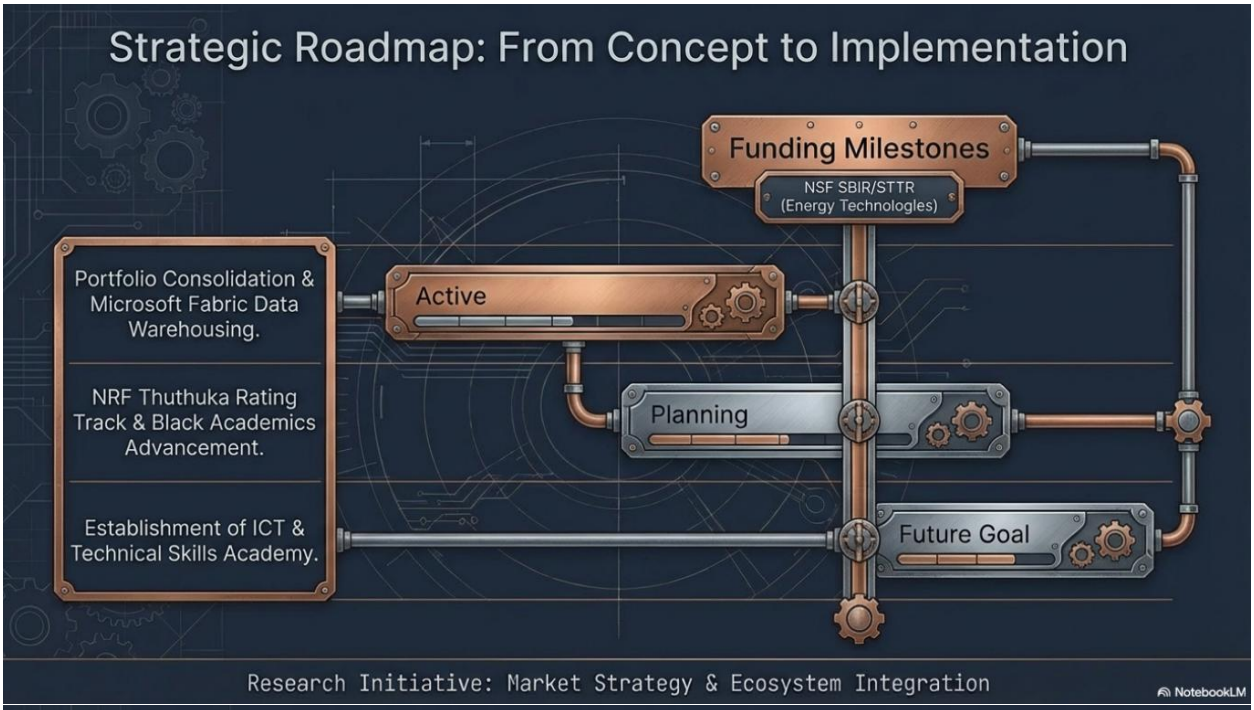
Career Discovery and Mentoring Framework

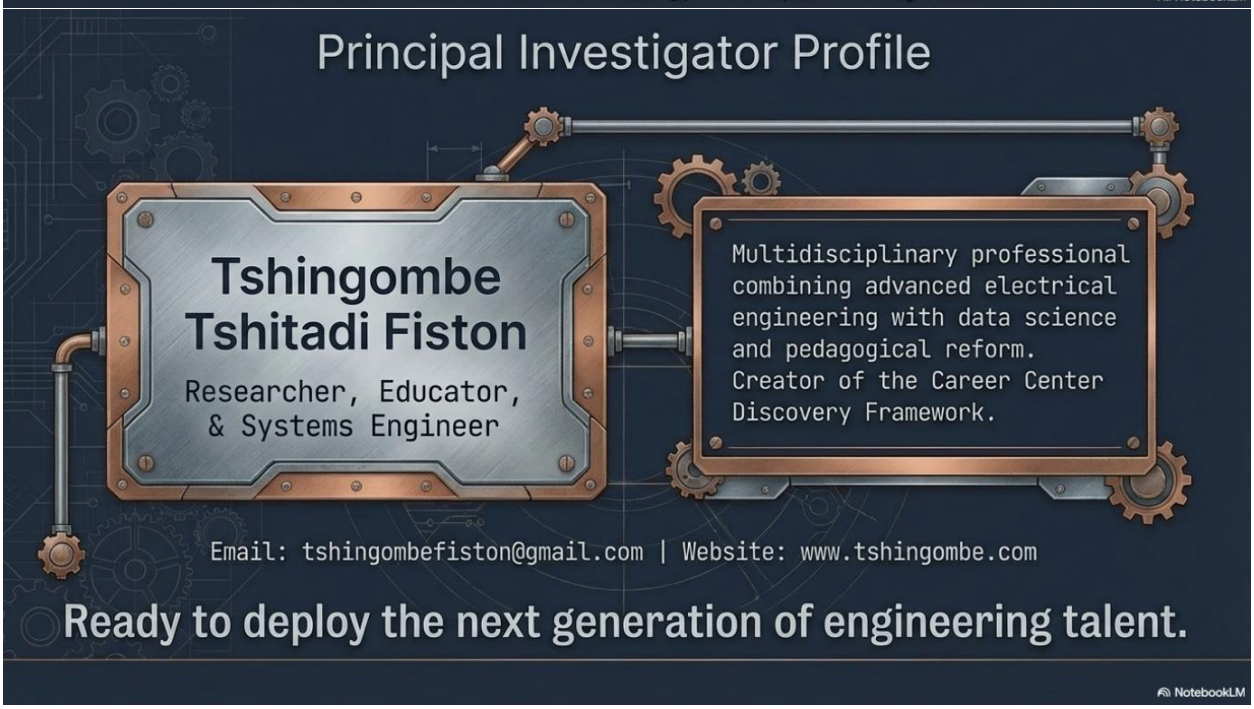
Research Initiative: Academic Digita Dashboard

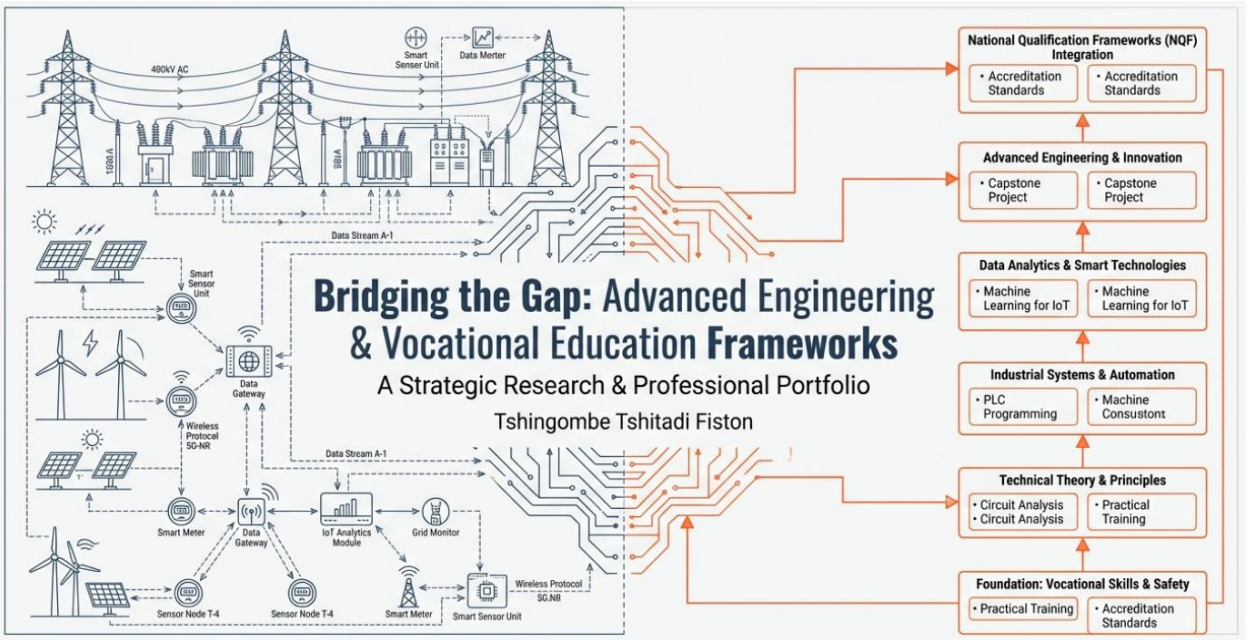
NotebookLM


Continuous Professional Development (CPD)
Alison Diploma in Electrical Studies
Project Management
Microsoft Certified: Azure AI Engineer Associate (In Progress)
Digital Badge
Certificate
In Progress
Performance Metric
Top percentile in abstract reasoning and numeracy aptitude tests.
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM


Institutional Affiliations & Research Networks
Academic
Guest Student Status
Research
CAMPUS mundi
MY AIU
Next Gen Researchers Symposium (NRF)
Open Source
Repository: career-discovery-science-mentoring
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM


Strategic Roadmap: From Concept to Implementation
Funding Milestones
NSF SBIR/STTR
(Energy Technologies)
Portfolio Consolidation & Microsoft Fabric Data Warehousing.
NRF Thuthuka Rating Track & Black Academics Advancement.
Establishment of ICT & Technical Skills Academy.
Active
Planning
Future Goal
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM


Principal Investigator Profile
Tshingombe Tshitadi Fiston
Researcher, Educator, & Systems Engineer
Multidisciplinary professional combining advanced electrical engineering with data science and pedagogical reform.
Creator of the Career Center Discovery Framework.
Email: tshingombefiston@gmail.com | Website: www.tshingombe.com
Ready to deploy the next generation of engineering talent.
NotebookLM



Integrating Industrial IoT, Data Analytics, and National Qualification Frameworks.

NotebookLM

Professional Profile & Institutional Affiliations

Tshingombe Tshitadi Fiston

Electrical Engineering Master | Researcher | Technical Educator

Academic

Guest Student, Atlantic International University (AIU).

Research

Published Author, International Journal of Engineering & Technical Research (IJETR).

Institutional

Connected to DHET (Department of Higher Education and Training) and SAQA (South African Qualifications Authority) frameworks.

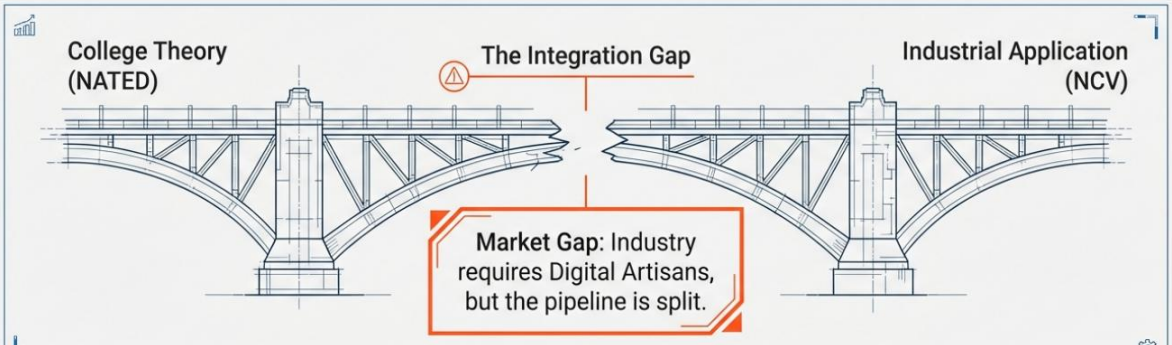
Industry

Engagement with Schneider Electric and Microsoft Learn technical paths.

MISSION STATEMENT: Modernizing African trade education by embedding advanced technology—from Smart Grids to AI—into the vocational curriculum.

NotebookLM

The Core Challenge: Fragmented Vocational Frameworks

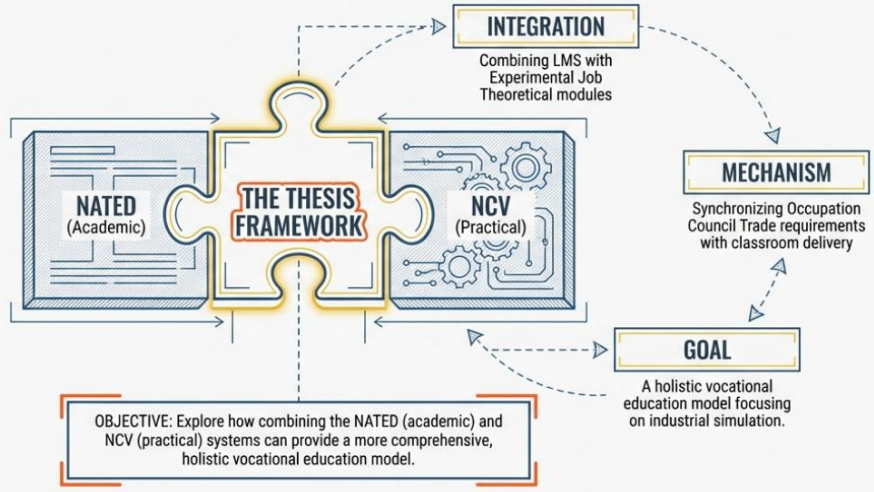


The Conflict	Key Insight	The Consequence
Disconnect between NATED (Theoretical) and NCV (Practical) qualifications.	System suffers from irregularity policy and lack of workbase experimental facilities.	Failure to produce work-ready artisans for complex systems.

NotebookLM

The Strategic Solution: A Holistic Vocational Model

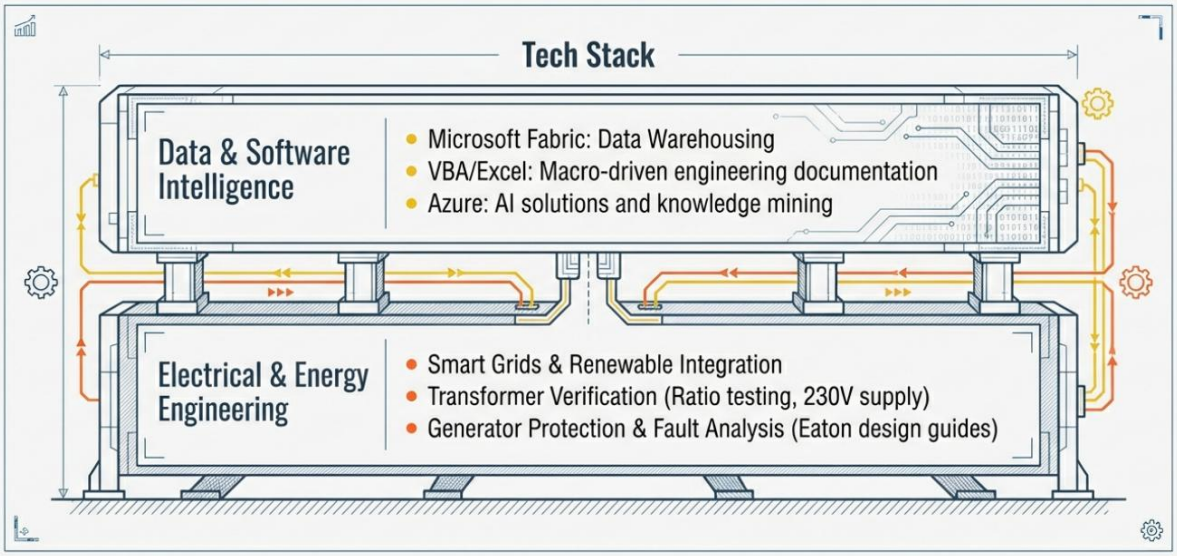
Implementation and Framework National Qualification: Integrating National Trade Examination Curriculum with Experimental Job Theory.


INTEGRATION
Combining LMS with Experimental Job Theoretical modules
NATED
(Academic)
THE THESIS FRAMEWORK
NCV
(Practical)
MECHANISM
Synchronizing Occupation Council Trade requirements with classroom delivery
GOAL
A holistic vocational education model focusing on industrial simulation.
OBJECTIVE: Explore how combining the NATED (academic) and NCV (practical) systems can provide a more comprehensive, holistic vocational education model.

NotebookLM

Technical Competence: The Engineering Stack

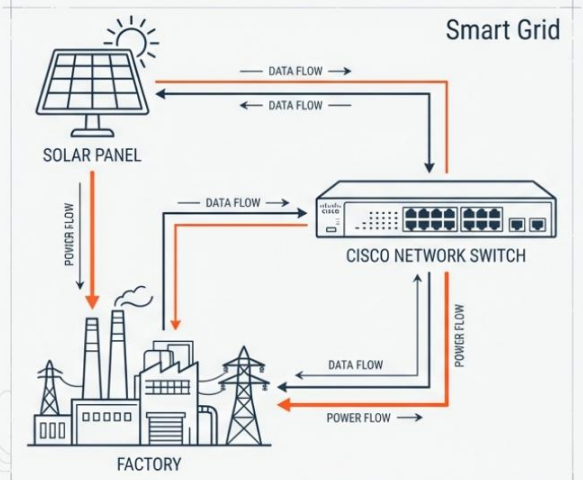
Schneider Electric


Tech Stack
Data & Software Intelligence
Microsoft Fabric: Data Warehousing
VBA/Excel: Macro-driven engineering documentation
Azure: AI solutions and knowledge mining
Electrical & Energy Engineering
Smart Grids & Renewable Integration
Transformer Verification (Ratio testing, 230V supply)
Generator Protection & Fault Analysis (Eaton design guides)

NotebookLM

Innovation I: Smart Energy & IoT Optimization

NSF Project Pitch #00100839 (Energy Technologies)



EXPERIMENTAL PROTOCOLS

1. **Network Traffic Impact**: Measuring correlation between network traffic and power usage in Cisco hardware.
2. **Smart Grid Performance**: Using networking devices to optimize energy distribution and fault detection.
3. **Renewables**: Configuring hardware to monitor solar panel integration in hybrid setups.

GOAL

Developing energy-saving features for industrial automation.

NotebookLM

Innovation II: The Career Center Discovery Framework

NSF Project Pitch #00107251 (Educational Technology)

DEVELOPMENTAL PATHWAY

Preschool → **Grade 1–13** → **TVET / University** → **Professional Roles**

Minim → **Cadet** → **Junior** → **Senior** → **Principal**

KEY FEATURES

- Psychometric Assessment: Identifying learning barriers and aptitudes.
- Portfolio-Based Assessment: Tangible artifacts for competency tracking.
- NSQF Benchmarking.

NotebookLM

"Technical Showcase: Automation & Engineering Interface"

2

Code Editor: Multi-Form Interface

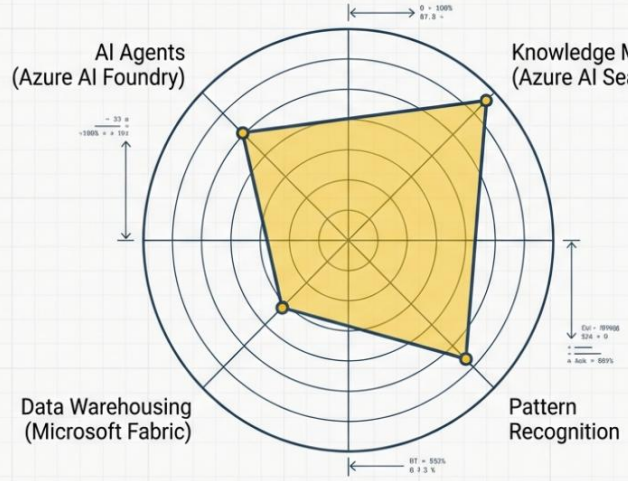
```
Module: reset_form() // Clears fields, initializes defaults
Module: Three-Phase Fault // Analysis logic
Project: Multi-Form VBA Interface for Engineering Documentation
```

- Automating student registration and assessment tracking.
- Engineering fault analysis (Three-Phase Faults).
- PLC command simulation.

NotebookLM

Advanced Analytics & AI Strategy

Leveraging Microsoft Ecosystem for Intelligence & Automation



Strategic Application

The LinkedIn Analogy

Using AI pattern recognition to analyze student performance data and industrial energy usage—similar to recommendation algorithms used by LinkedIn and Netflix. This facilitates predictive insights and personalized learning pathways.

Current Development Track: Microsoft Learn Plan - 'Develop AI Solutions with Azure'

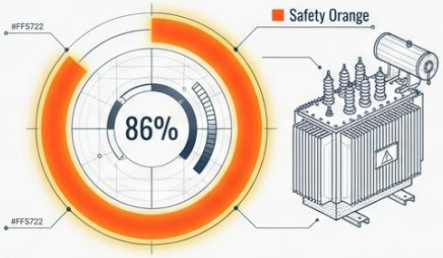
NotebookLM

Alison

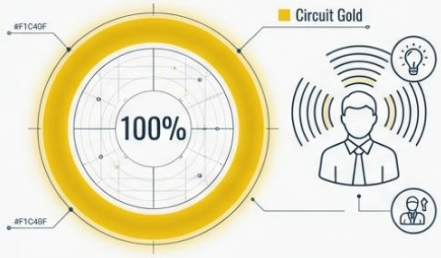
Continuous Professional Development (CPD)

CPD ACCREDITED

Electrical Transformer Components



Soft Skills (Assertiveness/Entrepreneurial)



Medal Cabinet

Self-driven upskilling in both hard engineering trade theory and business communication.

NotebookLM

Academic Validation & Research Traction

International Journal of Engineering & Technical Research (IJETR) - Vol 15 Issue 1	
Project career master job engineering thesis master rural experimental electrical engineering.	Accepted
Case Report: Research and project master energy rural career.....	Accepted
Project engineering Career Discovery and Mentoring Framework.	Submitted

Sidebar Note

Active contribution to the global body of engineering knowledge through peer-reviewed submission.

NotebookLM

Strategic R&D Initiatives (NSF Engagement)

America's SEED FUND SBIR.STTR

Project Cards

Safety Orange
Pitch #00100839
Energy Technologies (EN): Optimization of IoT Electrical Systems.

Project Cards

Safety Orange
Pitch #00097898
Advanced Systems for Scalable Analytics (AA).

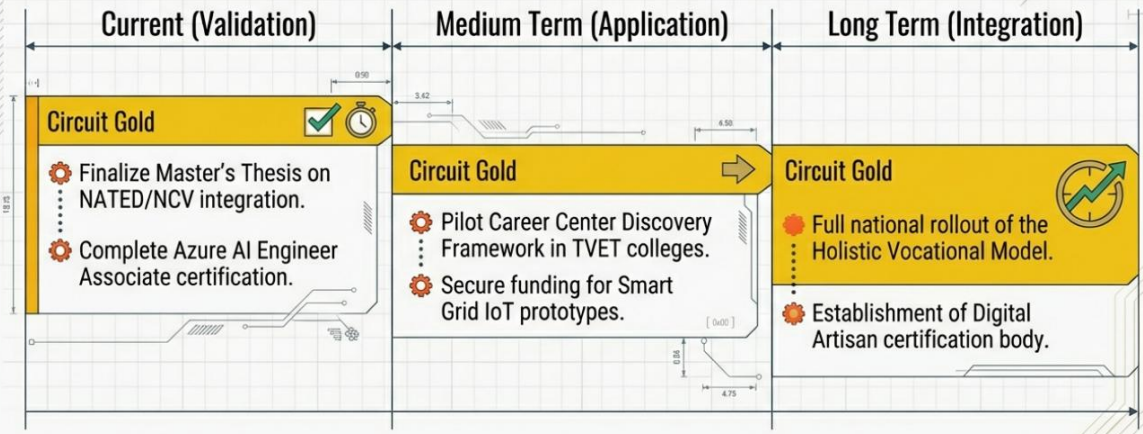
Project Cards

Safety Orange
Pitch #00095759
Advanced Manufacturing (M).

A repository of intellectual property and active research interests aimed at federal commercialization and pilot programs.

NotebookLM

Strategic Roadmap & Future Goals


Current (Validation)
Medium Term (Application)
Long Term (Integration)
Circuit Gold
Finalize Master's Thesis on NATED/NCV integration.
Complete Azure AI Engineer Associate certification.
Circuit Gold
Pilot Career Center Discovery Framework in TVET colleges.
Secure funding for Smart Grid IoT prototypes.
Circuit Gold
Full national rollout of the Holistic Vocational Model.
Establishment of Digital Artisan certification body.

NotebookLM

Partnering for the Future of African Engineering

Seeking collaboration on:

- Vocational Curriculum Design (NATED/NCV)
- IoT & Energy Efficiency Research
- Educational Data Analytics Projects

Tshingombe Tshitadi Fiston

Email: tshingombefiston@gmail.com

Website: www.tshingombe.com

NotebookLM

The Integrated Engineering Career & Education Framework

THE PROFESSIONAL & EDUCATIONAL LADDER

NATED & NCV Integration

NATED: Academic-based Qualifications

NCV: Practical, Trade-aligned Skills

Merging academic theory with practical trade skills for a holistic vocational model

Student Grade Levels (1–13)

Cadet to Principal Engineer Roles

Portfolio-Based Assessment

Theory-only Testing

Evidence-based Evaluation: Tangible experimental artifacts & measurable outcomes

Data Table

Technical Verification: Learner Competency Tracking

	Logic Gate Type	Verification Method	Outcome/Status
1	OR Gate	Switches + Lamp	Truth Table (A + B)
2	AND Gate	Switches + Lamp	Truth Table (A • B)
3	AND Gate (IC 7408)	Integrated Circuit	Logic state verification (Pins 1,2 to 3)

TECHNICAL INNOVATION & EXPERIMENTAL CORE

IoT-Enabled System Optimization

Cisco Hardware

Filter vs. vs. Traditional Non-IoT Systems

51%

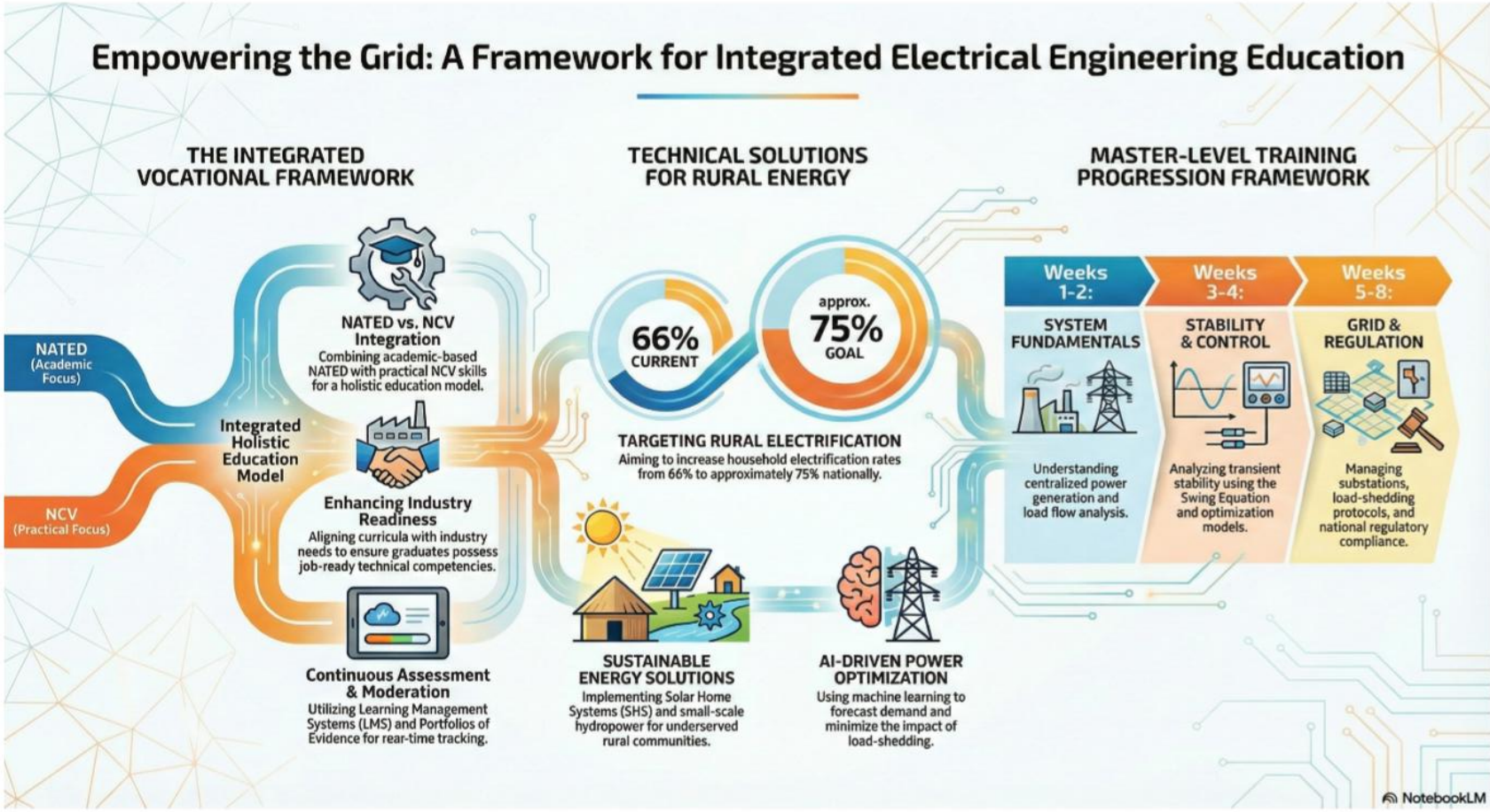
Primary Employment Rule

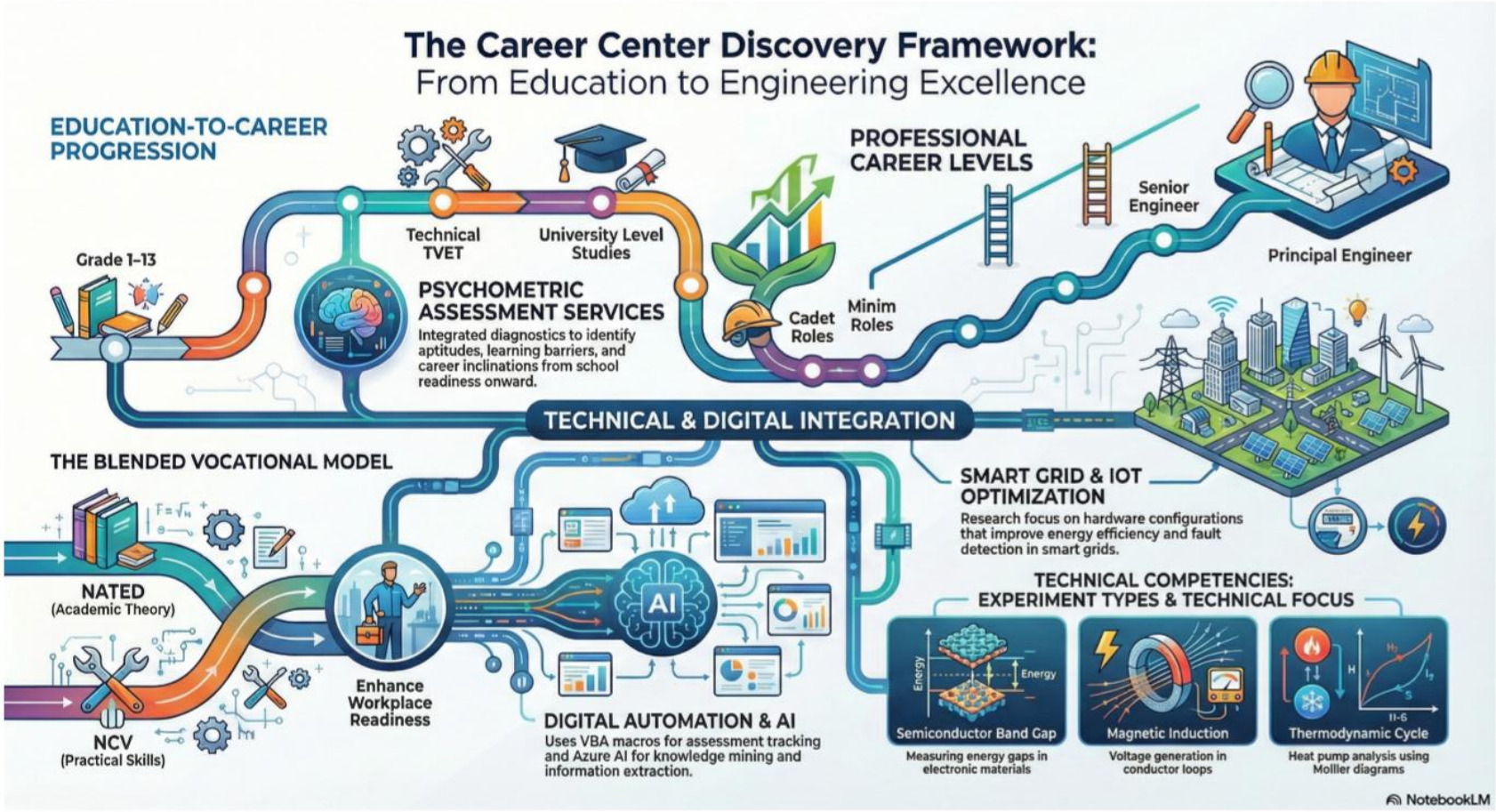
NSF SBIR/STTR eligibility requires Principal Investigators to be majority-employed by the small business

Smart Grid Load Management

Utilizing networking hardware to improve fault detection and load distribution within hybrid renewable energy setups

NotebookLM


Empowering the Grid: A Framework for Integrated Electrical Engineering Education
THE INTEGRATED VOCATIONAL FRAMEWORK
TECHNICAL SOLUTIONS FOR RURAL ENERGY
MASTER-LEVEL TRAINING PROGRESSION FRAMEWORK
NATED (Academic Focus)
NCV (Practical Focus)
Integrated Holistic Education Model
NATED vs. NCV Integration
Combining academic-based NATED with practical NCV skills for a holistic education model.
Enhancing Industry Readiness
Aligning curricula with industry needs to ensure graduates possess job-ready technical competencies.
Continuous Assessment & Moderation
Utilizing Learning Management Systems (LMS) and Portfolios of Evidence for rear-time tracking.
66% CURRENT
approx. 75% GOAL
TARGETING RURAL ELECTRIFICATION
Aiming to increase household electrification rates from 66% to approximately 75% nationally.
SUSTAINABLE ENERGY SOLUTIONS
Implementing Solar Home Systems (SHS) and small-scale hydropower for underserved rural communities.
AI-DRIVEN POWER OPTIMIZATION
Using machine learning to forecast demand and minimize the impact of load-shedding.
Weeks 1-2:
SYSTEM FUNDAMENTALS
Understanding centralized power generation and load flow analysis.
Weeks 3-4:
STABILITY & CONTROL
Analyzing transient stability using the Swing Equation and optimization models.
Weeks 5-8:
GRID & REGULATION
Managing substations, load-shedding protocols, and national regulatory compliance.
NotebookLM


The Career Center Discovery Framework:
From Education to Engineering Excellence
EDUCATION-TO-CAREER PROGRESSION
Grade 1–13
Technical TVET
University Level Studies
PSYCHOMETRIC ASSESSMENT SERVICES
Integrated diagnostics to identify aptitudes, learning barriers, and career inclinations from school readiness onward.
Cadet Roles
Minim Roles
PROFESSIONAL CAREER LEVELS
Senior Engineer
Principal Engineer
TECHNICAL & DIGITAL INTEGRATION
THE BLENDED VOCATIONAL MODEL
NATED
(Academic Theory)
NCV
(Practical Skills)
Enhance Workplace Readiness
AI
DIGITAL AUTOMATION & AI
Uses VBA macros for assessment tracking and Azure AI for knowledge mining and information extraction.
SMART GRID & IOT OPTIMIZATION
Research focus on hardware configurations that improve energy efficiency and fault detection in smart grids.
TECHNICAL COMPETENCIES: EXPERIMENT TYPES & TECHNICAL FOCUS
Energy
Energy
Semiconductor Band Gap
Measuring energy gaps in electronic materials
Magnetic Induction
Voltage generation in conductor loops
Thermodynamic Cycle
Heat pump analysis using Mollier diagrams
NotebookLM